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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/938,291	08/24/2001	Shunpei Yamazaki	0756-2353	1025

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NIXON PEABODY, LLP
8180 GREENSBORO DRIVE
SUITE 800
MCLEAN, VA 22102

EXAMINER

ROY, SIKHA

ART UNIT PAPER NUMBER

2879

DATE MAILED: 10/22/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application N .

09/938,291

Applicant(s)

YAMAZAKI ET AL.

Examiner

Sikha Roy

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AW

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21,23-39 and 41-64 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21,23-39 and 41-64 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

The Amendment, filed on July 25, 2003 has been entered and is acknowledged by the Examiner.

Cancellation of claims 22,40 and addition of new claims 60-64 have been entered.

Specification

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested:

--LIGHT EMITTING DEVICE COMPRISING LIGHT-EMITTING LAYER HAVING
TRIPLET AND SINGLET COMPOUNDS--.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1,4, 57 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 6,420,834 to Yamazaki et al.

Regarding claim 1 Yamazaki discloses (column 3 lines 29-40,60,61 column 4 lines 14-16, column 12 lines 18-33, column 24 lines 34-41, column 25 lines 34-40 Fig.6) a light emitting device comprising a substrate 11 having pixel portion, one EL element 43 in the pixel portion comprising a triplet compound (embodiment 11) and another EL element in the pixel portion comprising singlet compound (Alq as the host doped with fluorescent pigment).

Referring to claims 4 and 57 Yamazaki discloses (column 25 lines 44-65) the light emitting device used in electric appliance such as car navigation system, portable telephone.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2, 5, 20, 23, 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,420,834 to Yamazaki et al. and further in view of U.S. Patent 6,097,147 to Baldo et al. and U.S. Patent 5,457,565 to Namiki et al.

Yamazaki does not disclose the plural layers in the EL elements in the pixel.

Baldo in analogous art of electroluminescent device discloses (column 5 lines 63-65, column 6 lines 5-15, Fig. 3) light emitting device comprising a substrate having a

pixel portion with plurality of EL elements, each EL element comprising of anode 511, hole transporting layer 512, electroluminescent layer 513, hole blocking layer 514, electron transporting layer 515 and cathode 516 formed in this order on the substrate 510. Baldo further discloses (column 2 lines 25-31) this structure of light emitting devices provides enhanced efficiency of the device.

Therefore it would have been obvious to one of ordinary skill in the art to modify the two EL elements in the pixel portion of the light emitting device of Yamazaki by the multiple layer configuration disclosed by Baldo for providing enhanced efficiency of the device.

Regarding claim 2 Yamazaki and Baldo do not disclose at least one of the first and second EL layers comprising a plurality of hole transporting layers.

Namiki et al. in analogous art of organic electroluminescent device disclose (column 4 lines 15-27, 60-67 Fig.6) the EL device comprising two positive hole transporting layers 4a and 4b. The first layer 4a made of MTDATA has a high melting point and a high glass transition point and is hardly crystallized and further has an excellent thin-film formation property. The first hole transporting layer having high conductivity prevents undesired heat influence to the second layer upon application of electric currents.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to modify the single hole transporting layer (NPD) of the device of Yamazaki and Baldo et al. by adding another layer of MTDATA below and in contact with anode

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as taught by Namiki et al. for preventing undesired heat influence to the layer on the top, upon application of electric currents.

Claims 5 and 58 recite the same limitations as of claim 2, the light emitting device being used in an electric appliance such as computer monitor, telecommunication device and hence are rejected for the same reason as of claim 2.

Regarding claims 20 and 23 Yamazaki, Baldo and Namiki et al. disclose the hole transporting layer has a laminate structure of two layers containing MTDATA and α -NPD.

Claims 3,6-19, 21, 24-39, 41-56, 59 - 64 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,420,834 to Yamazaki et al., U. S. Patent 6,097,147 to Baldo et al. and U. S. Patent 5,457,565 to Namiki et al. and further in view of U.S. Patent 5,928,802 to Shi et al.

Regarding claim 3 Yamazaki, Baldo and Namiki et al. do not exemplify the hole injection layer in contact with the anode and deposited under the hole transporting layer.

Shi et al. in relevant art of organic electroluminescent devices disclose (column 4 lines 45-55 Fig.3) a hole injection layer 310 in contact with the anode 304 to improve the injection efficiency of the anode.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to include a hole injection layer as taught by Shi et al. in between the anode and the hole transport layer of the EL device of Yamazaki, Baldo and Namiki to improve the injection efficiency of the anode.

Claim 60 essentially recites the same limitation of claim 3 and hence is rejected for the same reason.

Claims 6, 59, 61 and 64 recite the same limitations as of claim 3, the light emitting device being used in an electric appliance and hence are rejected for the same reason as of claim 3.

Regarding claim 7 Shi et al. disclose the hole injection layer made of copper phthalocyanine (column 6 line6). Yamazaki, Baldo et al. and Namiki et al. disclose (column 6 lines 5-17) the hole transporting layer containing MTDATA and α -NPD, light emitting layer containing CBP doped with PtOEP, the hole blocking layer containing BCP and the electron transporting layer containing Alq₃.

Yamazaki, Baldo, Namiki and Shi et al. do not disclose the light emitting layer containing CBP and Ir (ppy)₃. The selection of known material for a known purpose is generally considered to be within the skill of the art. It would have been obvious to use CBP doped with Ir (ppy)₃ (both CBP with PtOEP and CBP with Ir (ppy)₃ being triplet compounds emitting different colors) because the selection of known materials for a known purpose is within the skill of art.

Regarding claim 8 Baldo et al. disclose (column 4 lines 38-67, column 5 lines 1-35) different light emissive organic compounds for blue, green and red emission. It is well known (as evidenced by Namiki and Shi et al.) in the art that a preferred embodiment of a luminescent layer comprises multi-component material consisting of a host material doped with one or more components of fluorescent dyes and EL devices can be tuned by using fluorescent dyes of different emission wavelengths in a common

host material. For EL element containing triplet compounds the suitable host material is CBP and green, blue and red phosphors may be chosen to emit green, blue and red light respectively. Shi et al. disclose tris (8-quinolinato) aluminum which produces excellent green luminescence. Blue dopants include tetracene, perylene and other conjugated benzenoids. Coumarins, rhodamins are used as dopants for EL emissions at longer wavelengths. A pixel portion referring to an addressable unit contains pixels of red, green and blue light emission. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to select the first EL element with triplet compound of Baldo et al. emitting red light and other second element emitting blue or green as disclosed by Shi et al. for producing multicolor display screen.

Claims 9-19 essentially recite the same limitation as of claim 8 selecting different combination of color of the emitted light from first and second EL elements and hence are rejected for the same reason.

Claim 21 essentially recites the same limitation as of claim 20 and hence is rejected for the same reason (see rejection of claim 20).

Claims 24-38 and 62,63 essentially recite the same limitation as of claim 23 and hence are rejected for the same reason (see rejection of claim 23).

Referring to claim 39 Yamazaki, Baldo and Namiki et al. disclose the first layer of the hole transporting layer is made of MTDATA for its high conductivity and excellent thin-film formation property and the second layer is made of α -NPD and the light emitting layer is in contact with the second hole transporting layer. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to specify

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the second layer containing α -NPD sandwiched between the first hole transporting layer containing MTDATA and light emitting layer of Yamazaki, Baldo and Namiki et al.

Claims 41-56 essentially recite the same limitation as of claim 39 and hence are rejected for the same reason (see rejection of claim 39).

Response to Arguments

Applicant's arguments with respect to claims 1,2,3 have been considered but are moot in view of the new ground(s) of rejection.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sikha Roy whose telephone number is (703) 308-2826. The examiner can normally be reached on Monday-Friday 8:00 a.m. – 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar D. Patel can be reached on (703) 305-4794. The fax phone number for the organization is (703) 308-7382.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

S.R.

Sikha Roy
Patent Examiner
Art Unit 2879



NIMESHKUMAR D. PATEL
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800